MARKED-UP VERSION OF SPECIFICATION

ROPE LOCKING DEVICE WITH AUTOMATIC SAFETY MECHANISM

INVENTOR: Brad E. Hossler

When counterweights are being added or removed, or when a load is added or removed from the lift lines, and the system is out of balance, the goal of a rope lock is to prevent uncontrolled movement of the rope, load, and counterweights. It is also desirable for the rope lock to automatically lock the rope in position and hold it, if the set is out of balance even if the operator opens the handle. However, traditional rope locks suffer from one or more of the following deficiencies. They may lack the capability to lock the rope in place by manually moving a handle, lack the capability to automatically lock the rope in place in response to a sudden imbalance in the system or a runaway situation, and they may use jaws to grip the rope in a manner that tends to cut into, pinch, and otherwise cause damage to the rope. In other words,

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view of the rope locking device with the left side plate removed to reveal the mechanism.

FIG. 2 is a view of the rope locking device from the front.

FIGs. 3a, b, and c are front, top, and side views of the first shoe.

FIGs. 4a, b, and c are rear, top, and side views of the second shoe.

FIGs. 5a and b are a front and side views of the lock roller assembly.

FIGs 6a, b, c, and d are the back, side, front, and lower views of the guide housing [respectively].

FIG. 7 shows a planar view of side plate 22.

FIG. 8 shows a planar view of side plate 23.

The means for manually closing the shoes comprises a handle 41, an upper and lower cam 100, 102 connected by a cam linkage plate 104, and linkage pins 148 and 149, and a locking roller assembly 106 connected to the upper and lower cams 100, 102 by an upper and lower linkage plate 101, 103, respectively, the linkage plates 101 and 103 being pivotally connected to the cams 100 and 102 at one end and pivotally connected to the locking roller assembly 106 at the other end (FIG. 5). The locking roller assembly 106 comprises a roller base plate 108 or a pair of parallel base plates 108a and 108b, and a plurality of rollers 110, 111 pivotally mounted on the base plate 108. Roller base plate pins 112, 113 extend outward from the base plate 108 and are received by a plurality of horizontal roller guide slots 114, 115 defined by the first and second side plates. The upper and lower cams 100, 102 are pivotally mounted on an upper and a lower cam pin 116, 117, respectively, which are received in upper and lower cam pin holes 118, 119 defined by the side plates 22, 23. FIGS. 7 and 8 show receptors 160 and 161 for 116 and 117 respectively in side plates 22 and 23, and receptacle 162. The cam linkage plate 104 is pivotally connected to the upper and lower cam 100, 102, such that the rotation of the cams are equal. An upper and a lower linkage plate 101, 103 connect the roller base plate 108 to the upper and lower cams 100, 102 respectively. Consequently, rotation of either cam causes the other cam to rotate an equal amount and causes the linkage plates 101, 103 to move the locking roller assembly 108 horizontally, without any rotation or vertical translation.

CLEAN VERSION OF SPECIFICATION

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FIG. 7 shows a planar view of side plate 22.

FIG. 8 shows a planar view of side plate 23.